

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

REMARKS/ARGUMENTS

The preceding amendments and following remarks are submitted in response to the final Office Action mailed March 24, 2005, setting a three-month shortened statutory period for response ending June 24, 2005. With this Amendment, claims 33, 36, and 46 have been amended, and claim 35 has been cancelled. Reconsideration, examination, and allowance of all pending claims are respectfully requested.

35 U.S.C. § 103(a) Rejections

On page 2 of the Office Action, the Examiner rejected claims 33-34 and 53-55 under 35 U.S.C. § 103(a) as being unpatentable over *DeWolf et al.* (U.S. Patent No. 5,279,458) in view of *Farley* (U.S. Patent No. 4,379,483). The Examiner states that *DeWolf et al.* disclose a thermostat system in which a central processor can monitor and download parameters to a plurality of zone control systems over a communication bus. The Examiner further states that *Farley* teaches a thermostat system having a first means for providing a modulated output and a second means for providing a non-modulating output such that one heating or cooling source is proportionally controlled and the other heating or cooling sources are controlled in an on/off manner. According to the Examiner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of *DeWolf et al.* such that the zone air conditioning systems included local thermostats having a first means for providing a modulated output and a second means for providing a non-modulating output such that one heating or cooling source is proportionally controlled and the other heating or cooling sources are controlled in an on/off manner in view of the teachings of *Farley*.

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

Applicant respectfully asserts that claims 33-34 and 53-55 are not obvious in view of the *DeWolf et al.* and/or *Farley* references. Claim 31 has been amended to include the limitations of claim 35, and now recites:

33. (currently amended) A thermostat system comprising:
a processor having a user interface; and
a program, in the processor, having an at least one configuration
for an air management system, the at least one configuration comprising:
an air management system identification;
a listing of zones for the air management system;
parameter settings for each zone;
schedules of the parameter settings;
a modulated control for a plurality of heating stages for at
least one zone;
a modulated control for a plurality of cooling stages for at
least one zone; and
a modulated control for a simultaneous operation of a
heating device and a cooling device.

(emphasis added). As can be seen above, amended claim 33 recites, among other novel elements, that the at least one configuration includes a modulating control for a plurality of heating stages, a modulated control for a plurality of cooling stages, and a modulated control for a simultaneous operation of a heating device and a cooling device. Antecedent support for this amendment can be found in previously presented claim 35 (now cancelled), which has been rewritten into independent claim 33 by the current Amendment.

The ability of the present thermostat system to provide a modulating control for a plurality of heating and cooling stages and for simultaneous operation of a heating device and a cooling device is significant for several reasons. For example, by providing a modulating control capable of modulating both heating and cooling devices simultaneously, the thermostat system can be tasked to better control humidity in certain

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

applications (*e.g.* by adjusting the ratio of the heating and cooling modulating valves). In addition, by providing a modulated control capable of modulating a plurality of heating and cooling stages, the thermostat may be able to maintain the outputs of the controlled stages at more efficient levels than is typically obtainable by modulating only one heating or cooling stage. For instance, by turning on one or more modulated components than may be needed and then running the components at an intermediate power level, the thermostat system may be capable of operating at greater overall efficiencies than conventional systems that operate using discrete outputs or with only a single modulated output.

In contrast to the present claimed invention, the *DeWolf et al.* and *Farley* references do not disclose or suggest a modulating control for a plurality of heating stages and cooling stages, and for a simultaneous operation of a heating device and a cooling device. The *DeWolf et al.* reference appears to suggest a control system (10) utilizing a number of individual space conditioning units (16) ("PTAC's") that can be controlled via a central computer (12) and a number of system managers (14) ("PSM's"). In describing the operation of the conditioning units (16), *DeWolf et al.* appears to suggest that each of the units (16) can be turned on and off in discrete fashion, allowing the control system (10) to condition only those rooms or spaces that are occupied in order to conserve energy usage. Nothing in the *DeWolf et al.* reference appears to suggest an air management system employing a plurality of heating and cooling stages, nor does that reference appear suggest the use of modulated conditioning units.

The *Farley* reference, in turn, appears to suggest a method of controlling heating and cooling sources wherein only one heating or cooling source is proportionally

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

controlled at a time while one or more other heating or cooling sources are locked in either an "on" or "off" position. As can be understood by reference to Figures 9 and 11 in *Farley*, an electronic thermostat can be configured to cycle through a number of binary numbers (*i.e.* "000" to "111"), which can be fed through several AND gates (65-73) to cycle the system through a first heat pump (H1), a second heat pump (H2), and a resistance heater (H3). A separate cooling mode having a similar configuration as the heating mode can be used to control a number of air conditioners (C1,C2).

In describing the actuation of the various heating and cooling components, *Farley* makes clear that only one proportionally controlled device can operate at any time. For example, *Farley* at col. 1, lines 47-56 provides:

The method of this invention overcomes the aforementioned limitations by allowing many stages to overlap each other in the temperature range. The stages are time separated, *in that only one stage is proportionally controlled at any one time*. The other stages are locked "on" or "off" to supplement the proportionally controlled stage. The method uses a *single* thermostat and therefore avoids the wide band of temperature ranges created by conventional multi-stage thermostat systems.

(emphasis added). See also *Farley* at col. 7, lines 5-13 (discussing the truth table of Figure 9). As can be seen from the above passage, *Farley* appears to suggest that only a single component can be proportionally controlled at any one time. Moreover, *Farley* appears to suggest the desirability of using only a single thermostat to control the heating and cooling components.

To establish a *prima facie* case of obviousness, all of the claim limitations must be taught or suggested by the prior art. See MPEP at § 2143.03. As discussed above, the *DeWolf et al.* reference appears to suggest a single-stage heating and cooling system employing non-modulated conditioning units. While the *Farley* reference does appear to

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

suggest multiple heating or cooling components for regulating temperature, nothing in that reference suggests a configuration for an air management system that includes a modulated control for a simultaneous operation of a heating device and a cooling device. To the contrary, the *Farley* reference appears to suggest that only a single modulated component can be actuated at any particular time. Thus, since the *DeWolf et al.* and *Farley* references fail to disclose or suggest a modulating control for a plurality of heating stages and cooling stages and for a simultaneous operation of a heating device and a cooling device, Applicant respectfully assert that the independent claim 33 is not obvious under 35 U.S.C. § 103(a).

In addition, Applicant respectfully asserts that there is no motivation or suggestion in the cited prior art to modify the references or combine the teachings with the knowledge available to one of ordinary skill in the art. The *DeWolf et al.* reference relates to the single-staged control of individual space conditioning units (16) that can be individually operated in an on/off (*i.e.* non-modulated) manner. The *Farley* reference, in turn, appears to describe a multi-staged method of controlling heating and cooling sources using a single modulated heating or cooling component in addition to one or more other heating or cooling sources locked in either an "on" or "off" position. Applicant submits that there is no motivation or suggestion to combine *DeWolf et al.* with that taught in *Farley* as these references relate to different types of systems (*i.e.* single-staged vs. multi-staged system) that employ entirely different types of heating and cooling mechanisms (*i.e.* individual conditioner units vs. multiple heating pumps and resistance heaters).

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination. *See In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). As the individual conditioner units (16) described in *DeWolf et al.* operate in an on/off manner without the use of modulated signals, Applicant submits that there would have been no motivation or suggestion to provide a modulated control to such units. Indeed, having a configuration that provides both a modulated heating and cooling signal to such units would likely not function with the type of conditioner units described in *DeWolf et al.*, which use reversing valves to alternate between the heating and cooling modes.

Turning next to the rejection of independent claim 53, Applicant asserts that there would not have been a motivation or suggestion to combine *DeWolf et al.* with *Farley* since *Farley* teaches away from the use of "a plurality of thermostats", as further recited in that claim. As discussed above, *Farley* appears to suggest the desirability of using only a single thermostat to control the heating and cooling components. While *DeWolf et al.* does describe the use of multiple conditioning units, Applicant asserts that there is no motivation to combine *Farley* with *DeWolf et al.* since *Farley* appears to teach away from such combination, stating that the use of multiple thermostats would undesirably result in a wide band of temperature ranges. *See Farley* at col. 1, lines 53-56. Again, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination.

Because claims 33 and 53 are allowable, dependent claims 34 and 54-55 are also allowable for the reasons stated above, and since they add other significant elements to distinguish them from the prior art. For example, claim 34 further recites that the

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

thermostat system includes a plurality of programmable thermostats, and that the processor may download the program having at least one configuration to each thermostat of the plurality of thermostats. Claim 55, in turn, recites that the thermostat system includes a sequencing system controller connected to a communications bus for controlling and staging a plurality of thermostats. Nothing in either the *DeWolf et al.* or *Farley* references discloses or suggests these features.

On page 3 of the Office Action, the Examiner rejected claims 35-37, 56-58, and 61-62 under 35 U.S.C. § 103(a) over *DeWolf et al.* (U.S. Patent No. 5,279,458) in view of *Farley* (U.S. Patent No. 4,379,483) as applied to claim 33, and further in view of *Worthington* (U.S. Patent No. 4,984,433). On that same page, the Examiner further rejected claims 38-40 and 59-60 under 35 U.S.C. § 103(a) over *DeWolf et al.* (U.S. Patent No. 5,279,458) in view of *Farley* (U.S. Patent No. 4,379,483) and *Worthington* (U.S. Patent No. 4,984,433) as applied to claim 35, and further view of official notice. Furthermore, the Examiner rejected claim 63 under 35 U.S.C. § 103(a) over *DeWolf et al.* (U.S. Patent No. 5,279,458) in view of *Farley* (U.S. Patent No. 4,379,483) and *Worthington* (U.S. Patent No. 6,241,156) as applied to claim 35, and further view of *Kline et al.* (U.S. Patent No. 6,241,156). Finally, on page 4 of the Office Action, the Examiner rejected claims 41-46 under 35 U.S.C. § 103(a) over *DeWolf et al.* (U.S. Patent No. 5,279,458) in view of *Farley* (U.S. Patent No. 4,379,483), *Worthington* (U.S. Patent No. 4,984,433), and official notice as applied to claim 40, and further in view of *Kline et al.* (U.S. Patent No. 6,241,156) as applied to claim 63.

For reasons similar to that given above and for other reasons, Applicant respectfully asserts that claims 35-46 and 56-63 are not rendered obvious by the above

Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

cited prior art combinations. As discussed previously, independent claim 33 recites, among other novel elements, a configuration for an air management system having a modulated control for a plurality of heating stages and cooling stages for at least one zone, and for a simultaneous operation of a heating device and a cooling device.

Independent claim 53, in turn, recites many of these limitations as well as the limitation that the thermostat system includes a plurality of thermostats. Thus, since the cited prior art fails to disclose or suggest all of the claim limitations of claims 33 and 53, Applicant asserts that claims 35-46 and 56-63 are also allowable.

In addition to not containing each and every element of independent claims 33 and 53, Applicant asserts that the cited prior art further fails to disclose other novel elements contained in claims 35-46 and 56-63. For example, with respect to the rejection of claims 35-37, 56-58, and 61-62, Applicant respectfully asserts that the *Worthington* reference does not teach the use of simultaneous heating and cooling and air moving modulation in order to provide temperature and humidity control, as stated by the Examiner.

The *Worthington* reference appears to suggest a microprocessor that controls a variable speed supply air fan (24) and a liquid subcooler including a number of individual subcooling coils (38,40,42,44) that can be individually actuated via an associated valve (46,48,50,52). Nothing in that reference, however, suggests a modulating control for a simultaneous operation of a heating device and a cooling device, as recited in prior claim 35 and in claim 56, nor does that reference disclose or suggest that the simultaneous heating device and cooling device is for affecting humidity, as further cited in claim 57. To the contrary, *Worthington* appears to suggest controlling humidity by actuating a

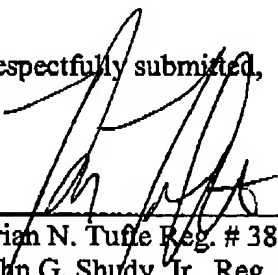
Application Serial No. 10/643,376
Amendment dated May 23, 2005
Reply to Office Action dated March 21, 2005

number of subcooling coils (38,40,42,44) without the simultaneous operation of a heating device. Accordingly, Applicant respectfully asserts that the cited prior art fails to render claims 35-46 and 56-63 obvious.

Reexamination and reconsideration are respectfully requested. It is respectfully submitted that all pending claims are now in condition for allowance, and issuance of a Notice of Allowance in due course is respectfully requested. If a telephone conference might be of assistance, please contact the undersigned attorney at (612) 333-1847.

Respectfully submitted,

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